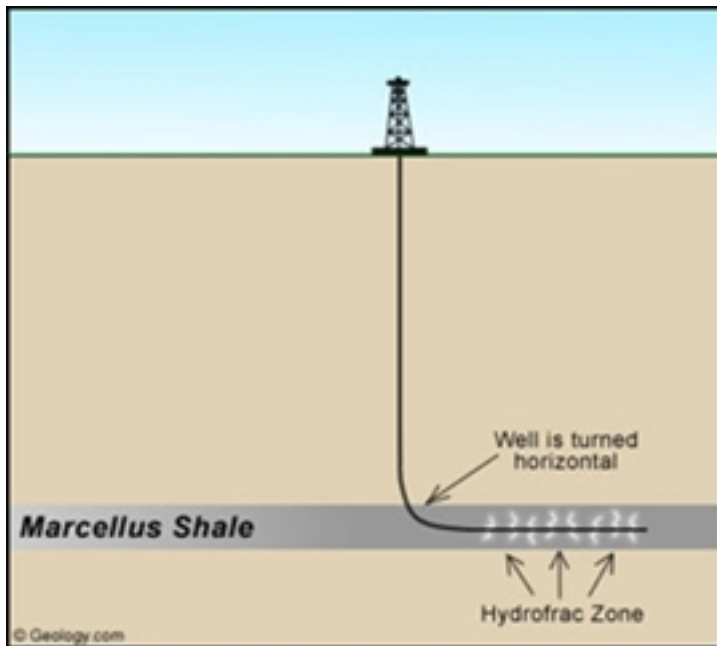


Horizontal drilling and hydraulic fracturing are legal and common in New York. The majority of wells in the Marcellus Shale will be hydraulically fractured.



**Horizontal drilling** has been used in New York since the 1980s. A "horizontal well" is first drilled down vertically to a depth above the target gas-bearing rock formation. Special tools are then used to curve the well so that the hole is drilled horizontally within the gas-bearing rock for up to several thousand feet. Ten percent of DEC's 2007 well drilling permits were for directional and horizontal wells.

Except for special tools used underground, horizontal drilling is performed using the same equipment and technology as vertical drilling, with the same protocols in place for aquifer protection, fluid containment and waste handling.

### **Benefits of horizontal drilling:**

- Maximum contact with the gas-bearing rock formation, so that more gas can be produced from a single well.

- Multiple horizontal wells can be drilled laterally from the same surface location, so that less of the ground surface is disturbed compared to using vertical wells to produce the same amount of gas.

**Hydraulic fracturing** consists of pumping a fluid and a propping material such as sand down the well under high pressure to create fractures in the gas-bearing rock. The propping material (usually referred to as a "proppant") holds the fractures open, allowing more gas to flow into the well than would naturally. No blast or explosion is created by the hydraulic fracturing process, which has been used in New York since at least the 1950s. Hydraulic fracturing technology is especially helpful for "tight" rocks like shale.

### **Quantity of water needed for hydraulic fracturing**

Hydraulic fracturing of the Marcellus Shale will require large volumes of water to fracture the rocks and produce the desired amount of gas. Each well may use more than one million gallons of water.

**The hydraulic fracturing fluid** typically contains compounds added to the water to make the hydraulic fracturing process more effective. These may include a friction reducer, a biocide to prevent the growth of bacteria that would damage the well piping or clog the fractures, a gel to carry the proppant into the fractures, and various other agents to make sure the proppant stays in the fractures and to prevent corrosion of the pipes in the well. The Department is assessing the chemical makeup of these additives and will ensure that all necessary safeguards and best practices are followed.

More information, including general information about fracturing fluid additives, is available in the report [Hydraulic Fracturing Considerations for Natural Gas Wells in the Marcellus Shale](#) released in September 2008 at the Ground Water Protection Council's Annual Forum.

### **Disposal of hydraulic fracturing fluid**

Fluid removed from the well is required by law to be handled, transported and disposed of properly.